

Purple Crow
(*Euploea tulliolus*)
male

White-margined Crow (*Euploea darchia niveata*)
males on *Trophis scandens*

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AIMS OF ORGANIZATION

- To establish a network of people growing butterfly host plants;
- To hold information meetings about invertebrates;
- To organize excursions around the theme of invertebrates e.g. butterflies, native bees, ants, dragonflies, beetles, freshwater habitats, and others;
- To promote the conservation of the invertebrate habitat;
- To promote the keeping of invertebrates as alternative pets;
- To promote research into invertebrates;
- To encourage the construction of invertebrate friendly habitats in urban areas.

MAGAZINE DEADLINES

If you want to submit an item for publication the following deadlines apply:

March issue – February 14th June issue – May 14th

September issue – August 14th December issue – November 14th

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COVER

Purple Crow (*Euploea tulliolus*) and White-margined Crow (*Euploea darchia niveata*) on *Trophis scandens* - Painting by Lois Hughes.



FROM THE PRESIDENT

The Club has again benefitted from the generosity of the Brisbane City Council by receiving a grant of \$1,000.00 towards the cost of publication of “Metamorphosis Australia” and a further \$350.00 to purchase software that will allow us to merge multiple digital images to form a single three-dimensional image. I again thank the Brisbane City Council for their support.

With this edition, you will find a notice of the Club’s next Annual General Meeting to be held on April 17th next. All positions on the planning committee are open for nomination and I invite members in the Brisbane area to come along to make a contribution. Unfortunately, Peter Hendry who has served as club secretary for several years has notified us that he will be unable to fulfill that role this year so we really would like a volunteer to step into the breach.

In my youth, the exclamation “Stone the Crows!” was not used in a literal sense but to express surprise and amazement. That expression comes to mind after reading the articles by John Moss and Peter Hendry on the Crow group of butterflies and realizing that there are many, many puzzles of the *Euploea* genus yet to be unraveled. I am sure you will find the other articles of great interest and thank the various authors for their contribution. If we put a dollar value on the many hours of observation, research and writing, then these voluntary contributions would make this publication a very expensive exercise.

Best wishes **Ross**

IN THIS ISSUE

Creature Feature - The Intriguing White-margined Crow (<i>Euploea darchia niveata</i>)..	4
Plant Profile - "Burny Vine" (<i>Trophis scandens</i>).....	9
Domatia Mites	11
A New and Interesting Foodplant for the Rare Red Eye (<i>Chaetocneme denitza</i>)	12
An introduction to Crows of the World, the <i>Euploea</i> s	13
Camouflaged <i>Tropidoderus childrenii</i>	25
Life History Notes on the Grey Ringlet (<i>Hypocysta pseudirius</i>)	26
2009 Australasian Butterfly Breeders and Enthusiasts' Conference.....	28
Excursion Report - Mt. Glorious Rainforest Walk - 28 th November 2009.....	31
At the Light Trap - Mt. Glorious - 28 th November 2009	32
Book Review - Arachnids by Jan Beccaloni	33
What Insect is this?.....	36
Other Groups' Activities	38
Swap Meet	38
BOIC Programme.....	38



The Intriguing White-margined Crow Butterfly *Euploea darchia niveata* (Butler, 1875) – John T. Moss

The appearance of this butterfly recently in the Brisbane area rekindled my interest in its historical record, relationships and biology. In the popular literature on Australian butterflies this species, usually uncommon north of Mackay and rare in the south of Queensland, stands out because of a dearth of available information.

Early History

This Queensland subspecies (of the Northern Territory's *Euploea darchia darchia*) has been known for nearly 240 years, as it was one of the butterflies collected by Banks and Solander in 1770, when HMS Endeavour was undergoing repairs at what is now Cooktown (McCubbin, 1971). Even so, Butler did not describe it until 1875 and later he listed it as a subspecies of the (then) Timorese species *E. hyems* (i.e. as *E. h. niveata*). However, W.S. Macleay had already described the nominate (N.T.) subspecies "Darwin Brown Crow" as *Danaïs darchia* in 1827.

Our "Purple Crow" (*E. tulliolus tulliolus*) had earlier been described from Australian material by Fabricius in 1793 as *Papilio tulliolus* (all butterflies then being assigned to this all encompassing genus – later reserved only for the Swallowtails).



Euploea darchia niveata male
Photo Russel Denton



Euploea darchia niveata male
Photo Russel Denton

The first time *E. d. niveata* appeared in the popular literature (as *E. hyems niveata*) was in Waterhouse and Lyell's classic 1914 work on Australian butterflies. G.A. Waterhouse included it again in his popular 1932 book "What Butterfly is That?" but neither book included any life history nor biological notes. However, Barrett and Burns (1951) provided a little more biological information such as frequenting "palm swamps" and "shady watercourses" but did not include hostplant information known at that time.



In the early literature all three taxa had been linked at some stage e.g. D'Abrera (1971), but it wasn't until 1964 that Common first listed *niveata* as a subspecies of *E. darchia*, where it has since remained, as he knew that the Timorese *E. darchia arisbe* (= *E. hyems*) was distinct from any Australian forms (Common, 1964).

Biology

There is very little known about its biology. Apart from Manski (1960) recording the larvae feeding on *Trophis scandens* (Lour.) Hook & Arn. (family Moraceae) (as *Malaisia scandens*) the life history of this subspecies is still unknown. I cannot find any further information confirming this record of Manski's. Meyer (1996) described the immature stages of the nominate subspecies at Darwin and recorded larvae also feeding on *M. scandens*. Scheermeyer (1999) in the chapter on Crow and Blue Tiger butterflies only gave passing reference to *E. d. niveata* and provided no new information. I cannot find any reference to this species in the literature in the decade following both Scheermeyer's paper and Braby, 2000. It is remarkable that the life history of *E. t. tulliolus* (Fabricius) from Queensland has likewise not been described completely, although its hostplant (also *T. scandens*) has been known for 70 years (Manski, 1939). In relation to *E. t. tulliolus*, Braby (2000) states "other aspects of larval and pupal habits are not documented".

Distribution Records

In relation to *E. d. niveata*, Barrett and Burns (1951) state "It is nowhere common and is confined to the coastal scrubs". However, McCubbin (1971) reports that this species was "common near Weipa in July 1969".

Common and Waterhouse (1981) gave the distribution as "Islands of Torres Strait and Cape York to Burleigh Heads, usually not common, rare at Mackay and further south" and specifically mention specimens known at that time from south of Mackay, viz. Yeppoon (S. Brown), Caloundra (J. Olive) and Burleigh Heads (T. Lambkin).

Dunn and Dunn (1991) provided multiple distribution records from the Torres Strait to Mission Beach Qld, but state that there are occasional published records or specimens from further south i.e. Mackay district (Waterhouse, 1932 and Barrett and Burns, 1951), Yeppoon (A.N.I.C. specimen), Caloundra (Olive, 1978) and Burleigh Heads (Common and Waterhouse, 1981).



Euploea darchia niveata female
Photo Peter Hendry



My own unpublished records for specimens collected in southerly latitudes include 2 female specimens: one dated 30th Oct. 1997 from near Landsborough (about 60 km north of Brisbane) and the other collected on 20th Feb. 1981 at Pottsville in northern NSW. This last record appears to be its southern-most delimitation.

Braby (2000) suggested that these southern records could be “vagrants” or accidental introductions transported as larvae or pupae on nursery plants. This suggestion might not be plausible as nurseries rarely, if at all, grow potted specimens of *T. scandens*. It is of particular note that almost all of these ‘southern’ specimens observed, photographed or collected, have been in fresh condition and flying or roosting in company with *E. t. tulliolus*.

Recent Information

A fresh but damaged male specimen of *E. d. niveata* was observed by Wesley Jenkinson and the writer in the first week of April 2008 whilst visiting the coastal hamlet of Stanage, about 175 km NNW of Rockhampton. It was roosting in company with several specimens of *E. tulliolus* in littoral vine scrub.

More recently our colleague Russel Denton observed and photographed a fresh male specimen of *E. d. niveata* in the Boondall Wetlands, east of Brisbane, on the 26th July 2009. It was again seen on a further visit to the site on the 2nd August 2009, photography confirming that it was the same specimen and apparently resident at the site (see photos, this article).

Comparisons – Allopatry, hostplants, cladistics and juvenile stages

Ackery and Vane-Wright (1984) produced distributional data, hostplant information and cladistic evidence which showed the very close relationships of four species within the *tulliolus*-complex. In fact they clearly state that “the four recognised “species” are indistinguishable except on general facies”.

Their distributional data showed definite allopatry, in that three of these “species” ranges did not overlap. For example, the widespread *E. tulliolus* was absent from “northern Australia” (N.T. and Kimberley implied), Timor, Banda and Kei Island groups, where its place is taken by *E. darchia* and *E. hewitsonii* replaces *E. tulliolus* in Sulawesi and the Sula Archipelago. *E. stephensii* is also present in the Sula Archipelago and throughout PNG where it occurs in sympatry with the local *E. tulliolus dudgeonis*.



Euploea darchia darchia male
Photo Peter Hendry



They state that it “may be significant” that *Trophis scandens* is a common hostplant for both *E. tulliolus* and *E. darchia* “as no other danaines use this genus” and further state that larval foodplant data for the other two species (*E. hewitsonii* and *E. stephensii*) is lacking. However, Parsons (1999) records “*Malaisia scandens*” as the hostplant for *E. stephensii* so it is likely that the Sulawesian *E. hewitsonii* will also be found to feed on this hostplant.



Euploea tulliolus tulliolus female
Photo Russel Denton



Euploea tulliolus tulliolus male
Photo John T. Moss

Their cladistic evidence shows identical morphological characters for *E. tulliolus* and *E. darchia* and very similar (one clade removed) for *E. stephensii* and *E. hewitsonii*. They further state that “the presence of *darchia* (on Timor) is a ‘novelty’ but this species is only doubtfully distinct (my emphasis) from the widespread and largely allopatric *tulliolus*”. They add, in relation to *E. tulliolus* and *E. darchia* “we have not found autapomorphies for either ‘species’”, meaning they have not found strong characters that separate the two species.

For such a common North Queensland butterfly it is odd that I can find only the one published photograph of Australian *E. tulliolus* larvae and this is in a privately published CD-Rom on attracting birds and butterflies to the home garden.

This and the photo in Parsons (1999) of the final instar larva of *E. t. dudgeonis* shows the same arrangement of fleshy tubercles and horizontal striping, although a different colour pattern to the photograph of the final instar larva of *E. d. darchia* in Meyer, 1996. Curiously, Parsons gives the same figure and plate number reference (3217/128) for the larval image of both *E. tulliolus* and *E. stephensii*!



Euploea tulliolus tulliolus male
Photo Peter Hendry



However the figure caption calls it *E. tulliolus*. As indicated above no photos of *E. d. niveata* larvae appear to exist.

Discussion

In regards to *E. d. niveata*, it is surprising that a strikingly patterned large butterfly, known since 1770, with a large coastal distribution and whose larval foodplant has been known for at least 50 years, has not had its life history recorded! The identical cladistic equations, same hostplants, similar habitats and close association of *E. t. tulliolus* and *E. d. niveata* could easily be explained by the hypothesis that these are synonymous i.e. are one and the same species – *E. d. niveata* merely being a form of *E. t. tulliolus* being expressed by a recessive gene or genes controlled by some unknown chemical, climatic or other environmental factor.

Furthermore, if this were to be proven, the position of the (allopatric) nominal subspecies, *E. d. darchia*, in the Northern Territory and the Kimberleys (as well as *E. d. arisbe* in Timor etc.) would have to be revised. It could revert back to a subspecies of *E. tulliolus* (i.e. *E. t. darchia*) as it had once previously been assigned (Waterhouse and Lyell, 1914) or it could remain as a separate species within its limited distribution.

In concluding I should point out that more work needs to be done with this complex to prove this hypothesis. Ideally, finding *niveata* progeny from eggs laid by typical *tulliolus* should suffice. This may already have happened, as Garry Sankowsky (pers. comm.) indicates that he bred *E. t. tulliolus* with extra white on the hindwing margins some years ago! Garry says that, unfortunately the specimens were not retained and as the photographic slides had deteriorated they were discarded. If that is the case, then it is vital that the work is repeated, recorded and published. It is not clear from our conversation whether these bred specimens had the full white-paneled hindwing markings (as per R. Denton's photo in this paper), or whether they merely showed increased white spotting on the hindwing margin which may be consistent with a minor variation in *E. t. tulliolus* pattern, as in Braby, 2000.

It is interesting to note that already some researchers are collaborating with the intention of revising the complex systematics of *Euploea* by use of molecular data (e.g. DNA studies) (Monastyrskii and Vane-Wright, 2009). Locally, Trevor Lambkin (pers. comm.) has commenced a study to attempt to elucidate many of the taxonomic issues surrounding Australian *Euploea* spp. by primarily using larval characters. Perhaps these studies will provide the much needed evidence to determine the true identity and taxonomic position of our intriguing White-margined Crow butterfly!

Acknowledgments

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PLANT PROFILE

“Burny Vine” (*Trophis scandens*) – John Moss

Trophis (Malaisia) *scandens* or “Burny Vine” is a climbing/scrambling member of the Fig family (Moraceae) which hosts three of our lovely “Crow” butterflies –



Euploea tulliolus (Purple Crow), *E. darchia darchia* (Small Brown Crow) and *E. darchia niveata* (White-margined Crow).

The common name “Burny” or “Burney” comes from the file-like nature of the stems which are covered in masses of closely spaced lenticels – the implication being that if you quickly run your hand down the stem, a burning sensation can arise. I have tried it – but I’m not all that impressed!

One should not confuse this name with the common name of the vine *Mucuna gigantea* – “Burny Bean” – an unrelated species (in the family Fabaceae) and also a butterfly hostplant (host for *Hasora discolor* – the “Green Awl”).

T. scandens has an enormous distribution – virtually the whole of eastern Asia including Malaysia, Indonesia and the Pacific, including Papua New Guinea. It occurs along creeks, rainforest margins and cleared rainforest areas.

I have not been able to ascertain the etymology of the generic name *Malaisia* which has been dropped by the botanists in favour of the less interesting *Trophis*. It is tempting to assume that the name has a geographical aetiology, because I can well remember coming across it in the tropical forests of the Malay Peninsular where it is host to the local subspecies of *E. tulliolus*.



Trophis scandens showing juvenile foliage



Trophis scandens flower buds



Trophis scandens mature fruit

In spite of its widespread distribution it is not always easy to find. Generally its leaves are dull green and in drought conditions fairly sparse. They are quite tough and only the juvenile leaves would be suitable as larval food.



I believe one of the reasons why our beautiful Purple Crow has been missing from southeast Queensland in recent years, is a result of many years of drought conditions. It is a rare event these days to find it on the wing in Brisbane and exceedingly rare to see the White-margined Crow.

Potted specimens of the plant are usually hard to come by as (with the exception of its fruiting phase) it is not all that attractive! However, it would probably grow from cuttings and of course from fresh seed if this were available. It may grow to be too large for smaller home gardens, but would be an excellent addition for revegetation sites.

Photos Ross Kendall

ITEMS OF INTEREST

Domatia mites – Peter Macqueen

At the recent BOIC outing at Mt Glorious, several rainforest plants with domatia were noted including on Brown Beech (*Pennantia cunninghamii*). Domatia are either tufts of hair or pits found on the underside of some leaves in the axils of leaf veins. Often these pits or tufts of hair are minute and sometimes only recognizable with the aid of a hand lens. They are useful structures to assist in the identification of some plant species as those who are familiar with the “Red Book”* would know. The occurrence of domatia is not limited to rainforest species, but found through tropical and temperate forests world wide, with many cultivated ornamental plants having domatia. However, the role of domatia is far more intriguing and purposeful than to help plant identification.

The name domatia is derived from the Latin *domatium* meaning “small house” and

this is exactly what they are for an extraordinary diversity of mites and occasionally other small insects such as thrips or small bugs. Some forms of domatia in other areas include hollow stems, stipules, for example in some African *Acacia* spp., or root tubers in ant-house plants. Ant-house plants, *Myrmecodia beccarii*, are found in north Queensland on mangroves and *Melaleuca viridiflora*. They are host to the ant *Iridomyrmex cordatus*, which tends the Apollo Jewel Butterfly, *Hypochrysops apollo apollo*.

Although we are often most familiar with



Brown beech (*Pennantia cunninghamii*)
upper surface showing the locations of
domatia, on the underside, in lateral vein
axils. - Photo Alisha Steward



plant damaging mites, these species are not found in leaf domatia, but instead roam the leaf surface, sometimes, as in the case of spider mites, building webs for protection.

Leaf domatia increase populations of non-plant feeding mites through mutualism by providing physical refuge for predaceous or fungivorous species, or the tufts of hair trapping pollen or fungal spores as a food source. The mites may either shelter in the domatia or lay eggs in the shelter of them.

Research has demonstrated that the mites provide a positive role in maintaining the health of their host plants, with research showing an increase in powdery mildew in grapes with the blocking of the domatia.

With the aid of a 10x or greater hand lens or microscope, a fascinating world of invertebrates can be observed in the domatia of their selected leaves.

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A New and Interesting Foodplant Record for the Rare Red Eye (Lepidoptera : Hesperiiidae : Pyrginae) – David Lane

The Rare Red Eye skipper butterfly (also sometimes referred to as the Ornate Dusk-flat), *Chaetocneme denitza* (Hewitson) has a wide distribution across northern and eastern Australia, ranging from the top end of Western Australia, the Northern Territory, and eastern Queensland from Cape York to Canungra (Braby, 2000). Its known foodplant associations are with various species of *Lophostemon* and *Eucalyptus* (Myrtaceae), and in northern Australia *Planchonia careya* (Lecythidaceae) (Braby, 2000).



Like other members of the genus, first instar larvae of *C. denitza* build a larval shelter on a leaf of the foodplant tree by cutting out and folding over a roughly triangular shaped “tent like” piece of leaf, appropriately silked and tied down, in which they rest upside down on the tent roof. This shelter is progressively enlarged by following instars by cutting out new and larger shelters, usually on an adjacent area of the tree –



Male pupal case (exuvium), *Chaetocneme denitza*, in final larval instar shelter, on *Thespesia populnea* (Malvaceae), Cooktown, Qld – Photo David Lane

the earlier shelter is severed and allowed to fall away, thus aiding in concealment of the larva’s presence. The final two instar larvae build an even larger and more elaborate tent shelter, usually by cutting out a more elongate boat shaped roof structure from an upper overlapping leaf, and attaching it by silk strands to the lower leaf. In northern Queensland, first and second instar larval shelters can be locally quite common,

particularly during broods in September and again in March, dependant upon seasonal rainfall conditions – however at these times there appears to be a high larval mortality rate from spider and large *Myrmecia* ant predation.

Recently, whilst searching for some Emperor Moth (family Saturniidae) larvae in and around the tidal zones near Cooktown, a final instar larva of *C. denitza* was found on *Thespesia populnea* (L. Sol. Excorea) (Malvaceae) (identification confirmed by Garry Sankowsky, Tolga). The adult male butterfly duly emerged some four weeks later.

The Common Red Eye, *Chaetocneme beata* (Hewitson) has been recorded on a wide range of foodplant associations, including *Hibiscus* sp. (Malvaceae) (Braby, 2000). It is most interesting to also observe *C. denitza* utilising this plant family as host.

Reference

Braby, M.F. 2000. Butterflies of Australia – Their Identification, Biology and Distribution. CSIRO Publishing.

An introduction to Crows of the World, the *Euploeas* (Lepidoptera : Danainae) – Peter Hendry

The *Euploeas* belong to the subfamily Danainae of the butterfly family Nymphalidae, although some authors place them in a family of their own, Danaidae. They are known as Crows, because of their mostly dark colouration, generally dark brown with some white markings. Some Crows have a blue or purplish sheen over part of their wings.





With one endemic species on the Seychelles and another on the Mascarene Islands, in the Indian Ocean, the remainder of the genus ranges from India and South-east Asia (from Sikkim, Tibet and Afghanistan in the east) as far north as the Ryukyu Islands

of southern Japan, throughout the Philippines and the Indonesian Archipelago, to New Guinea, the Bismarcks, Solomons, northern and eastern Australia, and the Islands associated with New Caledonia, the New Hebrides (Vanuatu), Fiji, Samoa, Tonga and as far eastwards as Niue, the Cook Islands and the Society Islands. (Parsons 1999) Fig.1.

The larvae feed on plants in the Apocynaceae, Asclepiadaceae and Moraceae plant families, many of which are poisonous to most animals. Most of these plants extrude milky latex when cut. Caterpillars of the Common Crow, *Euploea core corinna* (Fig. 16) sever leaf veins prior to feeding on their latex-bearing host plants, which restricts the flow of latex at feeding sites (Clarke and Zalucki, 2001). This has been observed for other species and genera. Over 100 species of Lepidoptera, Coleoptera and Orthoptera cut veins on host plants (Helmus and Dussourd, 2003).

By feeding on toxic plants the larvae, pupae and adults of some *Euploea* species are unpalatable to their otherwise enemies. In 1862 H.W. Bates supposed that certain widely distributed, common and conspicuous species, which possessed properties that made them distasteful to insectivorous animals, functioned as “models” for certain of the weaker and more palatable species of butterflies and moths in the same locality (Corbet and Pendlebury, 1956). This became known as Batesian mimicry.

In 1879, F. Muller propounded his theory of “mimetic rings” in which he considered that the dominant distasteful forms gained an advantage by mimicking each other. This facilitated the education of the enemies by giving them fewer patterns to learn (Corbet and Pendlebury, 1956). This is now referred to as Mullerian mimicry. Mimicry remains a phenomenon that is not well understood. In his paper, “Mimicry in Butterflies: Microscopic Structure”, Akira Saito (2002) put forth the following; “It is difficult to obtain credible answers to the following questions: how mimicry occurs at the genetic level; how mimicry has evolved; why there is no intermediate form between mimic and model; how the present variety of mimicry has been formed”. In some cases we are not sure what form of mimicry we are looking at.



Euploea species



Fig. 4

Euploea leucosticto depuisei (Sangihe Is.
Indonesia)



Fig. 5

Euploea leucostictos form *usipetes* (PNG)



Fig. 6

Euploea wallacei melia (PNG)



Fig. 7

Euploea eyndhovii gardineri (Malaysia)



Fig. 8

Euploea midamus chloe (Malaysia)



Fig. 9

Euploea midamus lippus (Simeulue Is.
NW off tip of Sumatra)



Euploea leucostictos form *usipetes* (Fig. 5) is clearly mimetic of *Euploea wallacei* (Fig 6) (Parsons, 1999). One would take this to be a Mullerian mimic, a distasteful *Euploea* mimicking a distasteful *Euploea*, but Parsons goes on to say; “It is possibly even a Batesian mimic as it feeds on doubtfully toxic *Ficus* sp., whereas *E. wallacei* utilizes *Parsonsia* sp., which is almost certainly toxic”.

Examples of Batesian mimicry include *Chilasa paradoxa* (Fig 29) which is a member of the Papilionidae family. W.A. Fleming lists three forms of this butterfly *C.p. aenigma*, *C.p. aegialus* and *C.p. leucothoides* ranging from N. India to Sumatra and Borneo. Each form mimics a different *Euploea* species, *E. mulciber* (Figs 10, 11, 24, 25 & 28), *E. radamanthus* (Fig 26 & 27) and *E. eyndhovii* (Fig. 7) respectively. To make it more interesting, the *Euploea* species are sexually dimorphic as are the *Chilasa* with males mimicking males and females mimicking females (Fleming, 1975). The male *Euploea mulciber* is also mimicked by the female Nymphalid *Hypolimnna anomala*. *E. midamus* is mimicked by the Zygaenidae moth *Cyclosia midama*. *Hypolimnna antilope mela* (Fig 31) a Nymphalid from the subfamily Nymphalinae mimics *E. eurianassa* (Fig 30).

Examples of Mullerian mimicry would have to include, *Euploea eupator* (Fig. 32) and *Euploea latifasciata* (Fig. 33).

Another feature typical of *Euploea* and Danainae in general, is that adult males require (as 'secondary hosts') plants of certain Boraginaceae, Fabaceae, Asteraceae and Apocynoideae to obtain protective compounds, pyrrolizidine alkaloids (PAs). This is independent of nutritional requirements but increases fitness. PAs are stored for protection against predators and are transferred to females (Forstzoologisches Institut, web page). In *Euploea*, adults of both sexes are almost equally attracted to PAs (Ackery & Vane-Wright 1984). PAs are required as precursors for synthesizing relevant male courtship pheromone components (Forstzoologisches Institut, web page). They are obtained from moistened dead, withered or damaged plant material, or from nectar of their flowers (Kitching, Scheermeyer, Jones and Pierce, 1999). During courtship pheromones are disseminated by the male hairpencils (Fig. 2). When the hairpencils are expanded the pheromone-transfer particles are showered on the females' antennae (Kitching, Scheermeyer, Jones and Pierce, 1999).



Fig. 2



Euploea species



Fig. 10

Euploea multiciber barsine ♂ (Taiwan)



Fig. 11

Euploea multiciber barsine ♀ (Taiwan)



Fig. 12

Euploea tulliolus tulliolus ♂ (Australia)



Fig. 13

Euploea tulliolus koxinga ♂ (Taiwan)



Fig. 14

Euploea configurata ♂ (Sulawesi)



Fig. 15

Euploea westwoodii ♂ (Wowoni Is. SE
off Sulawesi, Indonesia)



Euploea species



Fig. 16

Euploea core corinna ♂ (Australia)



Fig. 17

Euploea alcathoe eichhorni ♂



Fig. 18

Euploea alcathoe enastri [paratype]



Fig. 19

Euploea alcathoe enastri reverse



Fig. 20



Fig. 21

Euploea alcathoe melinda many nondescript spp. can be determined by spotting on the underside



Like their famous cousin the Monarch (*Danaus plexippus plexippus*), many of the *Euploea* are known to migrate and overwinter. In Taiwan, first discovered by an unknown lepidopterist in 1971, nine species of Danainae butterflies, including four *Euploea* species are known to migrate and overwinter. The *Euploea* species involved are *E. sylvester swinhoei*, *E. eunice hobsoni*, *E. mulciber barsine* (Fig. 10 & 11) and *E. tulliolus koxinga* (Fig. 13) (Wang and Emmel, 1990). A long distance east-west migration takes place through the plains of southern India, traversing a distance of 300-500 km, and involves several species of butterflies including, *E. sylvester* and *E. core* (Kunte, 2005). Siu Lang Shui, in Hong Kong, is a closed and restored landfill site which is almost entirely planted with exotic species like Cadaga (*Eucalyptus torelliana*) and Taiwan Acacia (*Acacia confusa*). A study in the winter of 2002-2003 estimated 32,000-45,000 individuals overwintered there, comprising six Danainae species including *E. midamus*, *E. core* and *E. mulciber* (Wong, Leung, Sze, Wong, 2004). In 1960, D. M. Bachelor wrote of a large-scale migration of *Euploea modestra* in Malaysia (Bachelor, 1960).



In Australia Braby (2000) notes the observations of McCubbin 1971; Kitching and Zalucki 1981; Monteith 1982; Scheermeyer 1985, 1993; and Jones 1987 with regard to aggregation of the Common Crow (*Euploea core corinna*) (Fig. 16). He also notes his own observation in 1991 of a large migration of the Common Crow in northeastern Queensland. Closer to home, Kitching and Zalucki 1981, discovered an aggregation of some 1200-1600 Common Crows in the grounds of Griffith University, Brisbane. On Cape York just north of Coen, Alex Wild photographed *Euploea sylvester sylvester* overwintering on the 25th Aug. 2004 (Fig. 3). A close look at the image reveals a *Danaus affinis* on the bottom left and second from the bottom on the right is a Common Crow. During 19th-20th Oct. 2001, *E. sylvester sylvester* (Fig. 34), *E. core corinna*

(Fig. 16) and *E. alcatheae eichhorni* (Fig. 17) were observed by Murdoch De Baar, roosting at Holroyd River Crossing, 90 km SW of Coen, (M. De Baar pers. comm.). There are undoubtedly many other instances of *Euploea* migrating or overwintering.

A very large number of so called species of butterflies are polytypic (many subdivisions), comprising numerous named subspecies distinguished on the basis of geographically correlated variability in wing pattern and the strikingly different local



Examples of sexually dimorphic *Euploeas*



Fig. 22

Euploea phaenareta callithoe ♂ (PNG)



Fig. 23

Euploea phaenareta callithoe ♀



Fig. 24

Euploea mulciber mulciber ♂ (Nepal)



Fig. 25

Euploea mulciber mulciber ♀ (Malaysia)



Fig. 26

Euploea radamanthus radamanthus ♂
(?China)



Fig. 27

Euploea radamanthus radamanthus ♀
(?China)



forms of many species (Kristensen, Scoble and Karsholt, 2007). This applies very much so to the *Euploea*. On their web site “The Catalogue of Life 2009” annual checklist contains 1045 names attributed to the *Euploea*. Many of these are doubles and triples named by different authors and numerous synonyms. Ackery and Vane-Wright 1984, rationalized the number of species to 54. Since then and as alluded to by them, Parsons 1991, has confined *E. usipetes* to *E. leucostictos* form *usipetes* (Fig. 5). The only other apparent change was by Saito and Inayoshi (2006), who described the species *E. conbuom* from southern Central Vietnam. Monastyrskii and Vane-Wright (2009) realized this to be *E. orontobates* described by Fruhstorfer in 1910 from southeastern Thailand and long confused with the local mimetic form of *E. core*. Thus *E. conbuom* is now viewed as a subjective junior synonym of the revised species *E. orontobates*. This still leaves us with 54 species although Monastyrskii and Vane-Wright are involved in a collaboration intended to revise the complex systematics of *Euploea* by use of molecular data (Monastyrskii and Vane-Wright, 2009). This does not take into account the numerous subspecies that exist. The Australian fauna contains nine species, with only five widely distributed on the mainland (Braby, 2000).

The IUCN Red List contains 19 species and 2 subspecies of *Euploea* as being either Lower Risk/least concern, Lower Risk/near threatened, Vulnerable or Endangered. This does not include the Australian Gove Crow Butterfly, *Euploea alcathoe enastri* (Fig 18 & 19) which is classified as Endangered under both the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the *Northern Territory Parks and Wildlife Conservation Act 2000*. It is restricted to the Gove Peninsula in far northeastern Arnhem Land, N.T. (Braby, 2007).

While the *Euploea* may not contain the most beautiful of butterflies, the many aspects of their life history complicated by their many forms, makes them a compelling subject to study. In writing this article I am indebted to the following: Jak Guyomar who gave me open access to his vast collection and library and put up with my many visits, Murdoch De Baar who willingly answered my queries, cast a critical eye over the article and provided the images of *Euploea alcathoe enastri* (Fig. 18 & 19), Alex Wild of Urbana, USA, who granted me permission to use his image of overwintering *Euploea* on Cape York (Fig. 3) and last but not least John Moss for a loan of Parsons’ “The Butterflies of Papua New Guinea”. Except for the above mentioned, all photos were taken by Peter Hendry.

Note: Places and countries in the accompanying image descriptions, reflects label data and may not represent the full distribution of the subject species.



Mimics



Fig. 28

Euploea multiciber basilissa ♂ (west Java)



Fig. 29

Chilasa paradoxa (Malaysia)



Fig. 30

Euploea eurianassa ♂ (PNG)



Fig. 31

Hypolimnys antilope mela (PNG)



Fig. 32

Euploea eupator (Sulawesi)



Fig. 33

Euploea latifasciata latifasciata



Forms of *Euploea sylvester* distinguished by the double sex brands in males



Fig. 34

Euploea sylvester sylvester ♂ (Australia)



Fig. 35

Euploea sylvester ♂ (Popondetta PNG)



Fig. 36

Euploea sylvester ♂ (Bulolo PNG)



Fig. 37

Euploea sylvester swinhoei ♂ (Taiwan)



Fig. 38

Euploea sylvester ♂



Fig. 39

Euploea sylvester ♀



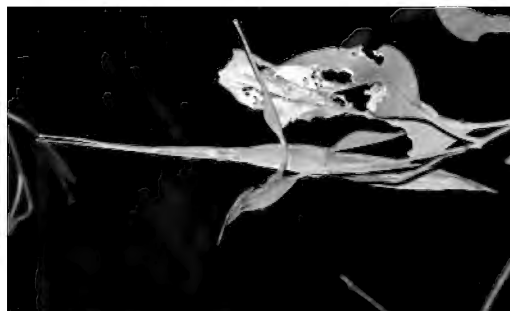
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You can't see meee!



Paul Brock found this remarkably camouflaged large female nymph of *Tropidoderus childrenii* on a eucalypt at Canberra on the last night of his Australian trip on 7 December 2009. This was the only stick insect seen in four nights searching in Canberra, but a drive from Rockhampton to Cairns between 14-25 November and

stopping at places en route, produced well known species and others new to science.

Further notes to follow.

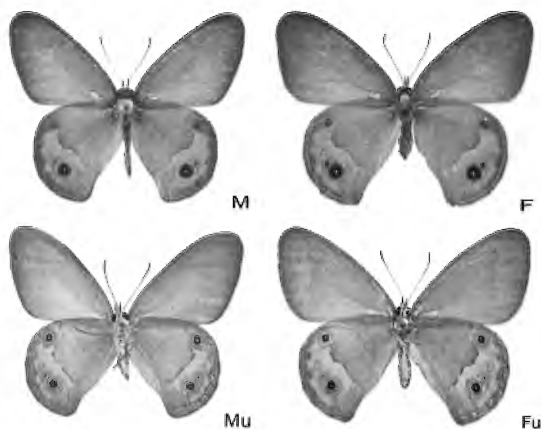
Photo Paul Brock



Life History Notes on the Grey Ringlet, *Hypocysta pseudirius* Butler, 1875 Lepidoptera: Nymphalidae -Wesley Jenkinson

The Grey Ringlet is another one of Australia's endemic species for which any published detail regarding the life history is minimal.

In Southeast Queensland the species is only found locally on the eastern side of the Great Dividing Range. It appears to be more widespread west of the Great Dividing Range throughout a range of drier forests and scrubs with a grassy understorey. The adults are usually localised, flying in dappled sunlight within forested areas, avoiding adjacent wide open grassland. They have a weak but typical ringlet 'bobby' flight. Once disturbed they can be difficult to follow through understorey vegetation. Both sexes are readily attracted to a variety of small native and introduced flowers. Their wings appear 'delicate' compared to other species in the genus.



Hypocysta pseudirius (Grey Ringlet)

Whilst in flight, the adults can be very easily confused with the Brown Ringlet *H. metirius*, particularly older worn specimens. In comparison to *H. metirius*, the ground colour is brownish grey rather than brown, the upperside hindwing orange patch is less extensive and slightly paler and the upperside eyespots are smaller in size. The average wingspan for the males is 27mm and 29mm for the females.

South of Beaudesert, in Southeast Queensland, I observed two females

fluttering slowly amongst the host grass and lay the eggs singly on the underside of leaves. While ovipositing, the wings remained closed and the abdomen was curled onto the host plant. Several eggs were collected for study. Unfortunately I could not identify the host grass. Subsequently the larvae were successfully raised on Green Couch (*Cynodon dactylon*) with all of the adults emerging as average sized specimens.



The eggs were slightly off spherical, approximately 0.5mm high x 0.5mm wide, smooth and cream coloured.

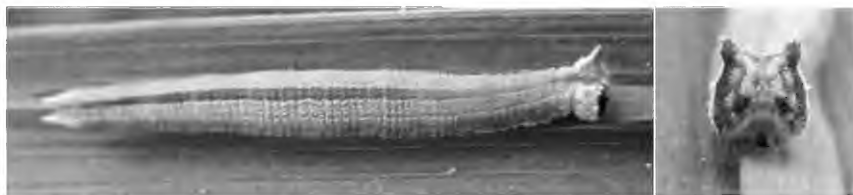
←Freshly laid egg of *H. pseudirius*





1st instar larva

The first instar larvae emerged after dawn and consumed their eggshells shortly afterwards. The larvae were observed feeding solitarily during the day and resting on either side of the leaves of the host plant. Typically like other species in the genus, they were very slow moving and fed from the outer edge of the leaf. All of the larvae raised completed four instars and attained a length of 21mm to 23mm.



4th instar larva



Pre-pupa, pupa dorsal and lateral view

The pupae were attached by silk to grass stems, hanging by the cremaster with the head suspended down. They were green in colour with an average length of 10mm. In captivity during June at Beaudesert, the adults emerged between mid morning and mid afternoon.

Eggs laid on 18th March 2009 hatched in 3 days with the larval duration varying from 29 to 37 days. Pupal duration varied from 11 days to 14 days, with adults emerging in June which was 46 to 51 days after oviposition.

Within the boundary of the new Scenic Rim Regional Shire south of Brisbane I have some adult records for the months of October and March. This may suggest there are



two generations annually within this region. I also have other records from Southeast Queensland: near Roma in November 1998, near Leyburn in January 2001 and 2004, and Wondul Range National Park (near Millmerran) in March 2004.

Reference:

Braby, M.F. 2000. Butterflies of Australia – Their Identification, Biology and Distribution. vol 2. CSIRO Publishing.

2009 Australasian Butterfly Breeders and Enthusiasts' Conference - Butterfly Breeders Unite! – Skye Blackburn

The first ever 2009 Australasian Butterfly Breeders and Enthusiasts Conference was held at the Novotel Darling Harbour in Sydney 21-22nd November 2009. Butterfly-mad people from all over Australia and New Zealand converged for this 2 day event organised by Jacqui Knight (AKA Madame Butterfly), Patricia Humphries (Butterflies R us) and myself (Butterfly Skye's). The event was based around getting to know each other and sharing our butterfly knowledge. Many of the participants run their own butterfly business or are hoping to start their own business in the future, but despite seeming very similar on the surface, each business has its own niche with many participants choosing to conduct presentations in their specialised area.

Fiona from the Coffs Harbour Butterfly House at Bonville conducted a presentation on butterflies for tourism. Her fantastic presentation covered the ins and outs of looking after butterflies while marketing them and making her butterfly house viable as a tourist attraction.

Jacqui Knight was kind enough to share her experiences in marketing as well as Monarch butterfly tagging (which is currently being conducted in New Zealand). From this presentation the butterfly breeders who breed Monarch butterflies have decided to begin a similar program in Australia at the end of the 2011 breeding season (more information below). She also had great knowledge in Monarch butterfly host plants and she had detailed information and pictures of each type which I can definitely say was very helpful to all in attendance.

Eddie Tsyrlin shared some very interesting information about the evolution of butterflies. He was also kind enough to detail how he sets up portable butterfly houses for use at fairs and special events. Who could have known that butterflies like to “eat” Ribena!?

We also had some special guests in attendance who were invited to share their expertise in their specialised area. Rick Donnan from the Hydroponics Association opened our eyes to the benefits (and also the work and costs involved) in setting up host plants to grow hydroponically.



Don Herbison-Evans also conducted several presentations on some interesting Australian butterfly species, his comprehensive website all about caterpillars, butterflies and host plants as well as butterfly photography (and how to edit these photos so that they look amazing).

Ed. Don Herbison-Evans informed us of a change in the URL of his caterpillar webpages. While attending the conference, Fiona Barden of the Coffs Harbour Butterfly House kindly offered to host the caterpillar webpages on her website. So the URL is now: <http://lepidoptera.butterflyhouse.com.au/>

I conducted my own presentations all about Integrated Pest Management (I am definitely no expert but I do use IMP at my farm) where everyone learned all about ladybugs and lacewings and how to use them effectively to keep aphids and other plant pests away. I also did a presentation all about...well presentations, and how to make them interesting as well as educational. During my presentation everyone got to touch and hold some really big bugs including burrowing cockroaches as well as stick insects and rainforest millipedes. I use these interesting invertebrates to show children how amazing creepy creatures can be.

The attendees were kindly invited by the head invertebrate keeper of Sydney Wildlife World to have a behind the scenes tour of their tropical butterfly house which was definitely a big highlight of the weekend. They do not breed any of their own

butterflies there (most of them are supplied by members of the BOIC and the International Butterfly Breeders Association (IBBA). This is due to the hard work and time it takes to breed butterflies successfully as well as the staff and space that they currently have available (Wildlife World is located on a floating pontoon in Darling Harbour). During our visit into the butterfly house, a female Common Eggfly decided that it would be a good idea to first lay eggs inside Nicole De Graff's hair and then move on to laying eggs on the lenses of



Henry will be seeing spots before his eyes!
Photo Skye Blackburn

Henry Rich's glasses. Interesting to say the least! This occurs because there are no host plants for any of the butterfly species to lay eggs on inside the enclosure; this is to stop them from being able to continue their life cycle. Unfortunately this means that the butterflies will lay eggs on almost anything including glasses and hair! Staff members for Wildlife World collect as many eggs as they can and return them to butterfly suppliers so that they can be taken care of properly.



It was scheduled that we would have a live internet link with the IBBA's annual convention in New Orleans. Although this started off well with everyone being able to see and meet many of the IBBA members, the link was broken when their guest speaker Chip Taylor began his presentation. This was disappointing but we live and learn so next time we will make sure that the presentation is able to be viewed by all. At the end of the conference all of the attendees received a special gift from Linda Rodgers and Nigel Venters of the IBBA. Their swallowtail hand pairing DVD was kindly donated for the convention and was greatly appreciated by everyone.

Overall, with a few minor hiccups, the conference was a great success with all participants wanting to have a similar event held in 2 years time. The next conference will be held in winter so that more breeders are able to attend without having to organise other people to run their farms while they are attending the conference. We will also be organising more special guest speakers to bring their knowledge in specialised areas to the conference. The conference was a great opportunity to meet all of the people that we have known for so long so that we can finally put faces to names and voices. Speaking for myself I know that I learned a lot about the different areas of butterfly breeding and I would recommend this event to anyone who has an interest in butterflies, even if you don't intend breeding them!

Future Event - Monarch Butterfly Tagging 2011

Want to know where all of the butterflies have gone??

A great initiative that has come from the 2009 Australasian Butterfly Breeders and Enthusiasts Conference has been the agreement to start a Monarch Butterfly Tagging program (similar to the one that is run by Monarch Watch in NZ). All of the butterfly breeders around Australia that breed Monarch butterflies will donate and release tagged Monarch butterflies from several locations within their states at the end of the 2011 Monarch breeding season. What we hope to learn from this experiment is the migration pattern (if any) of Australian Monarch butterflies in winter and if they have specific over-wintering sites within Australia. The key to the success of this project is educating the public on what to do if they find a tagged Monarch butterfly. The only way we can know where the tagged butterflies go is to find them again after they have been released. A website is currently under construction with detailed information about this project, which will include a form to enter details of any tagged Monarch butterflies people find. I know that 2011 seems a long way off, but that means that we will have about 16 months or so to let people know about this project so that it can be a great success. Please tell your friends! Contact me directly for more information contact@butterflysky.com.au

Ed.: Skye and a colleague travelled down from Sydney and donated a total of 346 butterflies for a butterfly release at the Kinglake Memorial on 7th February 2010, the first anniversary of the Black Saturday Victorian bushfires.



Mount Glorious Rainforest Walk Excursion

Saturday 28th November 2009 – Alisha Steward

A small group of BOIC members met at the start of the Maiala Circuit Track, Mount Glorious. We hadn't even started the walk when we were greeted by a lovely black and orange tiger moth. We also watched butterflies fluttering through the car park – it was some time before the walk was underway! We noted Orchard Swallowtails (*Papilio aegeus aegeus*), Black Jezebels (*Delias nigrina*), and Caper Whites (*Belenois java teutonia*). Host plants included *Alphitonia excelsa*, *Argyrodendron actinophyllum*, *Smilax australis* and *Wilkea macrophylla*.

As per most BOIC excursions, the walking pace was slow and steady. We were often overtaken on the path by other groups, while observing an invertebrate or host plant! There was so much to see. One interesting find was a tiny, delicate-looking green spider which appeared to have a peculiar head. On closer inspection, the peculiar feature turned out to be a cluster of green eggs. Perhaps the eggs belonged to the spider, or did they belong to a parasitoid?



We eventually reached Greene's Falls. Peter MacQueen observed some leaf domatia from a tree near the falls that were home to mites – please refer to his article on leaf domatia and mites in this edition of the magazine. In addition to leaf domatia, we saw a few different kinds of leaf gall. One large gall was discovered on an *Alphitonia excelsa*. We also discovered a fern frond infested with

nematodes, which were responsible for the dark bands along the fronds.

The highlight of the excursion for me, apart from seeing Greene's Falls and the beautiful surrounding rainforest vegetation, was the aquatic invertebrate fauna near the waterfall. We had a close encounter with a striped leech, watched whirlygig beetles



(Family Gyriniidae) dance near the water's surface, and saw many dragonfly larvae stalking prey on the bottom of the pools. We had such a good time on the walk (taking longer than planned) that the café we were intending to go to for afternoon tea was shut by the time we arrived there!

I left before the night activities took place. A few BOIC members stayed on to conduct light trapping for moths. (See "At the Light Trap" in this issue)

AT THE LIGHT TRAP

Mt Glorious - Saturday 28th November 2009 – Peter Hendry

Following the day's events Kris Di Marco stayed on and was joined by John Moss, Richard Zietek and Peter Hendry for a light trap. John was excited by the twilight chorus of cicadas but as the night progressed only 3 species made an appearance. Richard had little luck with the beetles, with only a few common species finding their way to the light. The most impressive of these was a large click beetle.



Compsothorna oligarchica



Cryptophasa flavolineata



Cryptophasa pultenae

Kris and Peter fared better on the moth front, adding several new species to their records. Kris was particularly taken by the satin white on the Xyloryctidae, *Cryptophasa pultenae*. Other Xyloryctidae to make an appearance were, *Compsothorna oligarchica*, *Cryptophasa flavolineata*, *Echiomima fabulosa* and *Thymiatris cephalochra*. Three similar looking moths, *Ethmia clytodoxa* and *E. sphaerosticha* and *Yponomeuta internellus*, all with black dots on a white or light-



Argyrolepidia subaspersa



Cardamyla carinentalis



Comostola laesaria



grey background, representing two families (Ethmiidae and Yponomeutidae), were recorded.

Several specimens represented the daytime flying Agaristinae, in the form of *Argyrolepidia subaspersa*. The beautiful *Cardamyla carinentalis* stood in for the Pyralidae and the Geometridae subfamily Oenochrominae was represented by the mountain species *Phrataria replicataria*. Another subfamily of the Geometridae, saw an old favourite come to light, the delicate *Comostola laesaria*. Another old favourite from the Eupterotidae family was *Panacela lewinae*. This was the first moth to come to light when I first set up my own light trap at home.

While we were not overrun by large numbers of any insects the night still proved fruitful, the company pleasant and just a great way to spend the evening.



Echiomima fabulosa



Ethmia clytodoxa



Panacela lewinae



Phrataria replicataria



Thymiatris cephalochra

BOOK REVIEW

‘Arachnids’ by Jan Beccaloni - review by Densey Clyne



Half a century has passed since I first became fascinated by the spiders in an overgrown garden in a leafy suburb of Sydney. What I discovered then about their amazing behaviour and lifestyles inspired many articles, a few books and later several documentary films about them.

So with such a spidery background it is an obvious pleasure for me to review “Arachnids” by Jan Beccaloni



(320 pp), a comprehensive and very readable account not only of the Araneae (Spiders) but also of their closest relatives.

This is not a field guide but a comprehensive biology – and don't let me put off those of you who find scientific terminology a little daunting. There is more to this book than anatomy and physiology and esoteric language. I wish that 50 years ago I'd had access to such a readable and attractively presented scientific background to my tentative field studies of backyard spiders!

However, the book goes beyond the world of spiders and covers the much larger group to which they belong. Some other arachnids - scorpions and ticks for instance - are familiar to us while some are seldom encountered. Others again are not found in Australia at all but all make for fascinating reading.

"Arachnids" is illustrated by many excellent photographs, gleaned from a large list of sources, and by helpful diagrams and charts. The layout is attractive and eye-catching. The writing style is readable and shows more than a hint of the author's enthusiasm for her subjects, with touches of light humour that appeal greatly to this fellow 'arachnoscribe'.

The book is divided into twelve chapters. It starts with an introduction that puts spiders in their place as the Order Araneae, just one of eleven Orders within the Class Arachnida. This includes a fossil history of the arachnids, a description of common physical characteristics, a table giving size, number of species and key characteristics of each Order, and a general review of the biology and behaviour of the group as a whole. The 11 Orders are then dealt with in separate chapters, starting, I was pleased to find, with Araneae (spiders) at Chapter 2. Each chapter contains essential information about classification, anatomy, distribution, habitats etc., with extended sections on the biology and behaviour of the particular Order.

For me, it is those sections covering behaviour that make the most fascinating reading, especially when it comes to spiders. To deal adequately with the sheer diversity of spiders and their amazing life-stories would require more than a single chapter but there's enough here to seduce the most intractable arachnophobe. The spiders are grouped according to their predation techniques with an interesting section on web construction and the uses of silk, and the tricks and traps used by hunters and ambushers. Of course our notorious funnelwebs and redbacks get a mention!

Reading this chapter I am reminded again of the astonishing sex life of spiders. Be advised, by the way, that female spiders do not usually eat their lovers! The author has listed some of the strange courtship and mating rituals by which the males avoid such a sticky end and I am tempted to repeat them here but - read the book!

While spiders have merited the longest chapter in the book, those other arachnids we are all familiar with, the ticks and mites of the Order Acari, are also dealt with extensively in Chapter 8. It is interesting to note that in number of world species



(45,231) those unloved little animals actually outdo the useful and attractive (!) spiders (40,024) and certainly cause a lot more damage.

We learn that mites range in size from a mere 1/500in to a grape-sized fully engorged tick; they are found in every habitat including the fresh and salt water, plant and animal tissues, leaf litter and soil – there can be up to 250,000 of them in a metre of topsoil! As for the astonishing range of unusual micro-habitats I can't do better than quote from the book: “. . . they are found . . . inside bat anuses, inside the nasal passages of seals, in porcupine ears, in the legs of owls, within the skin of the legs of chickens and in the digestive systems of sea urchins!”

There is a useful section covering the medical and veterinary importance of the Acari, including the ones we know so well, the Ixodida or ticks, and the dust mites. The chapter as a whole, with its incredible macro photographs of these strange often microscopic little creatures, might not endear us to the Acari but as the author points out, some species of mites have a useful role as biological controls in plant husbandry - and how interesting that some species of mites living in Antarctica survive by secreting anti-freeze in their blood! Just another invention for which we humans falsely take credit.

At chapter 10 Scorpiones, the next most familiar arachnid, comes well down the population scale with only 1500 known species. Scorpions have a nasty reputation but the author tells us that while they are a significant cause of death in some parts of the world, the majority of scorpion stings are no worse than a bee sting. Small scorpions are not uncommon around gardens and years ago I was stung by one I found wandering down the hall of my Sydney house. No damage, just an itch, but I wouldn't take any chances with the big tropical and outback species.

The book allows us to look at scorpions in depth without risk, and we learn that scorpions have their saving graces. As the author points out, the 'promenade a deux' of their courtship and mating is charming (as Walt Disney first showed us many years ago) and they are exemplary mothers. Pregnancy in scorpions, we are told, lasts 2-18 months, which at the longer extreme is “around the same gestation period as the white rhino”!

The third largest order of Arachnids, with possibly 10,000 spp., is Opiliones (Chapter 9), often called daddy-long legs but not to be confused with the spiders of the same name. They are also known as harvestmen or harvest spiders. These hunters and scavengers are mostly found in the humid tropics, but being nocturnal they are not often seen. Common species are easily recognised by the tiny round body and incredibly long, stilt-like legs, but the author describes others with elaborate body patterns and even bright colours. As for courtship behaviour, it seems male harvestmen are promiscuous and fiercely aggressive, and are not averse to ripping each other's legs off! Uniquely among arachnids, though, some male harvestmen



provide parental care, building a shelter over the eggs when the female has laid them and left them!’

Next in number of species comes Pseudoscorpiones (Chapter 11), with more than 3000 species world-wide in many different habitats. In spite of their common name these little arachnids have no sting and their only resemblance to scorpions is the greatly enlarged claw-like palps. They don’t look particularly interesting but their looks belie them, as this chapter points out. For instance they can produce silk, not as a spider does, but through their chelicerae. Then there is their use of *phoresis* - a surprising distribution strategy in which a more mobile animal (usually a winged insect) is co-opted by a less mobile one to carry it to a new destination.

Pseudoscorpions are enthusiastic such hitchhikers, hanging on tightly to the legs of compliant flies and beetles.

So far I have mentioned only five of the Arachnid orders covered by the book. As I find this review is already too long, I shall simply mention briefly the smaller and lesser-known groups. We may never or seldom come across these, but learning about their secret lives from an expert like Dr. Beccaloni is the next best thing – and in many cases, less trouble and more instructive!

The Solifugae, the Ricinulei and the Uropygi are apparently not found in Australia. We have one tropical rainforest species of Amblypygi or Whip spiders, so called for their long, whip-like front legs. The Schizomida or Short-tailed Whip Scorpions, with 46 Australian species, are small tropical arachnids with no sting. Colourless and transparent, the tiny Palpigradi or Micro Whip Scorpions are thought to be the most primitive of the arachnids but little is known of their biology and behaviour. Two introduced species are found in Australia.

Reviewing this book has given me not only a lot of pleasure but an opportunity to learn much that I did not know about the amazing little arachnids that share our world. It is entertaining as well as instructive, and I wholeheartedly recommend it.

WHAT INSECT IS THIS?

Response to Mystery Photographs appearing in Issue 55 – John Moss



Photo Ross Kendall

The “turret” that Ross Kendall photographed in the dry woodland area west of Warwick, Qld, was almost certainly built by a large cicada nymph. Max Moulds in his book, *Australian Cicadas* (1990), reports this behaviour in the species *Cyclochila australasiae* but I have seen nothing in the Australian literature since then.

Cicadas build these structures just prior to



emergence, where they sit just below the surface in their underground tunnels, awaiting the ideal conditions and time to emerge. Ross may have a point when he says the “turret” may have been built to prevent surface water runoff from flooding its underground chambers.

The structures are often dome-shaped (that is they are roofed over) suggesting either that this one’s occupant had already emerged, or alternatively that it was incomplete. Ross measured it as being 30 mm high, but Max reports that they can be up to “10 cm tall”.

It is believed that the nymphs carry globules of mud up from the deeper, wetter sections of their chamber to the surface, where it is deposited like mud bricks! They have been observed to have a remarkable method of changing direction in their narrow burrows – this is by spinning around an axis formed by their hind legs, which are fixed into the wall of the tunnel.

As *C. australasiae* (“Greengrocer” or “Yellow Monday”) is absent from this habitat, and the dominant cicada here is the large and noisy *Psaltoda pictibasis* (“Black Friday”), I suggest that this species would be the most likely builder of the turret. Final instar nymphs are usually slimmer than the fully expanded adult, so the 25 mm diameter structure would be an appropriate size for this species.



Photo Ross Kendall



Psaltoda pictibasis male – Photo Peter Hendry

The second photograph is certainly reminiscent of a burrow of a spider in the trapdoor group, the lid being very suggestive. However, as my knowledge in this area is limited, another member may have a more precise answer.

WWW TO WATCH

<http://australianbutterfliesphotographed.com/> - This site shows nearly all of the Australian butterflies live.



BOIC ON FACEBOOK

BOIC is now on facebook!

Type <http://www.facebook.com/group.php?v=wall&gid=187619097411> into your browser. View details of upcoming excursions, read posts on invertebrate discussions, share invertebrate information, and more!

OTHER GROUPS' ACTIVITIES

The Society for Growing Australian Plants (Qld Region) Inc. will hold their Autumn Sale of Australian Native Plants on **Saturday 17th April 2010** from **9 am to 3 pm** at the **Grovely TAFE**. A wide range of Native Plants will be on sale - Rare - Old Favourites - Grafted - Unusual - Drought Tolerant - Bird, Frog or Insect Friendly. The prices are friendly too. Admission FREE. For more information - call 3870 8517 or 3202 5008 or visit SGAP Qld Region 'on line'- www.sgapqld.org.au.

Indigi Day Out – 5th and 6th June, 2010 – Discover the wonders of IndigiScapes on this fun-filled family weekend. There will also be many wildlife displays and mini workshops plus a music festival. This is IndigiScapes 10th Anniversary year.

SWAP OR SELL MEET

When and where: At IndigiScapes, to follow the AGM, **17th April 2010** (see Programme)

What: The idea of a swap meet is to sell, trade or give away your unwanted items that others may find useful. For the BOIC swap meet please bring along any items that might come in handy for potting up host plants, butterfly gardening, invertebrate collecting, etc. Please limit the swap meet items to ones relevant to the club - no car parts please!! Examples include empty tubes and pots (always needed!), plant tags, host plants, host plant seeds, invertebrate books, newsletters and other publications, invertebrate collecting equipment such as nets, etc... If you plan to sell, we ask that you consider giving a small donation to the club. Also if you are moving soil and plants from a declared fire-ant zone, please refer to the relevant legislation about moving these items.

BUTTERFLY AND OTHER INVERTEBRATES CLUB PROGRAMME

Annual General Meeting

What: Our Annual General Meeting and election of Office Bearers. This will be followed by a Swap or Sell Meet (see previous notice). IndigiScapes Tea Gardens cater for delicious morning teas, lunches, and afternoon teas at a very reasonable cost if you wish to partake before or after the meeting.



When: Saturday 17th April, 2010 from 10am for the AGM
Where: Redlands IndigiScapes Centre, 17 Runnymede Road, Capalaba
Contact: Daphne 3396 6334 or email daphne.bowden1@bigpond.com to RSVP or for more details.

Excursion to the Scenic Rim: Mt Greville and Reynolds Creek

When: Sunday 9th May 2010

What: A 2-part excursion to the scenic rim:

Part 1: A walk up Mt Greville via Palm Gorge. We'll see the gorge (60 min. walk), and we hope to see some hill-topping butterflies at the summit. NOTE: this is a 4-hour return walk that has been classed as a "5", meaning that it is a difficult walk in parts and you should be physically fit and an experienced bush walker. It is a mountain, after all! We will walk in a group - the track is not well-defined, but apparently it's easy to follow. For more details please refer to: http://www.derm.qld.gov.au/parks/moogerah-peaks/about.html#things_to_do

Part 2: We will depart Mt Greville and drive to Reynolds Creek for lunch (about 5 mins away), and Alisha will tell you about her PhD on temporary streams (Reynolds Creek is one of her study sites). We'll then look for aquatic and terrestrial invertebrates near the creek. I recommend driving home to Brisbane via the cute village of Kalbar.

Meet: At the Aratula Bakery from 7:30am for an **8am sharp departure**. The bakery and the cafe next door are good places for a coffee. Look for Alisha wearing a BOIC name badge! Please RSVP so we have an indication of who is coming. If you wish to meet for part 2 only, please let Alisha know. You may like to make your own way to Reynolds Creek, or else meet us at the Mt Greville car park. We should be at Reynolds Creek by 1pm.

Directions: Provided on RSVP.

Bring: Water, hat, sunscreen, insect repellent, sturdy shoes and lunch (or purchase lunch at the bakery or cafe beforehand). Also feel free to bring along any invertebrate field guides etc. you may have.

RSVP: Alisha Steward, 0402 091 863, a.steward@griffith.edu.au

Planning and Management Meeting

What: Our planning meetings are informative and interesting. As well as planning our activities we share lots of information. All members are welcome as this activity is also a general meeting of members.

When: Saturday, 15th May, 2010 from 1.30 pm

Where: Ross Kendall's home, 17 Eldon Street, Indooroopilly

RSVP: Ross on 07 3378 1187 or Daphne on 07 3396 6334

Indigi Day Out (see Other Groups' Activities for details)

What: We will be holding a display with mini workshops on butterflies and native bees. We will have all of our merchandise for sale.

When: Saturday 5th and Sunday 6th June, 2010 from 10am to 4 pm

Where: Redlands IndigiScapes Native Botanic Gardens, 17 Runnymede Road, Capalaba

Contact: Daphne 3396 6334 email daphne.bowden1@bigpond.com or IndigiScapes on 3824 8611 for more details.



DISCLAIMER

The magazine seeks to be as scientifically accurate as possible but the views, opinions and observations expressed are those of the authors. The magazine is a platform for people, both amateur and professional, to express their views and observations about invertebrates. These are not necessarily those of the BOIC. The manuscripts are submitted for comment to entomologists or people working in the area of the topic being discussed. If inaccuracies have inadvertently occurred and are brought to our attention we will seek to correct them in future editions. The Editor reserves the right to refuse to print any matter which is unsuitable, inappropriate or objectionable and to make nomenclature changes as appropriate.

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We would like to thank all these people for their contribution.

Dedicated to a better Brisbane

ARE YOU A MEMBER

Please check your mailing label for the date your membership is due for renewal. If your membership is due, please renew as soon as possible. **Membership fees are \$25.00 for individuals, schools and organizations.** If you wish to pay electronically, the following information will assist you: BSB: **484-799**, Account No: **001227191**, Account name: **BOIC**, Bank: **Suncorp**, Reference: your membership no. and surname e.g. **234 Roberts**.

Butterfly and Other Invertebrates Club Inc.
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Next event – Annual General Meeting – 17th April

(See Programme for details)



Magazine of the Butterfly and Other Invertebrates Club #56 – Page 40